1. Magnetic bearing in which a first part (1, 20) is mounted magnetically relative to a second part (3, 10) and the second part (3, 10) has a Type II superconducting material (2) containing an anisotropic crystal or a plurality of grains formed of this anisotropic crystal, this crystal being anisotropic in that the superconducting current flows in current-carrying planes, and wherein the first part (1, 20) has a configuration of magnets (1; 6, 7, 8; 11, 12, 13, 14; 30, 31, 32, 34; 50, 51, 52, 53) with which the superconducting material interacts, and the crystal itself or the crystal in the plurality of grains faces the first part (1, 20) with the normals on the current-carrying planes (a-b).

2. Magnetic bearing in which a first part (1, 20) comprises a configuration of magnets (1; 6, 7, 8; 11, 12, 13, 14; 30, 31, 32, 34; 50, 51, 52, 53) and is mounted magnetically relative to a second part (3, 10), this second part (3, 10) being a Type II superconducting material (2) which can be cooled to below its critical temperature by means of a connected cooling system, wherein the superconducting material (2) contains a plurality of grains, each comprising an anisotropic crystal, and the current flowing in the superconducting state flows in every grain in a current-carrying plane (a-b) of the grain, and wherein the superconducting material (2), in terms of its structure, is a melt-textured multigrain material with grain sizes in the range of 2 mm to 20 mm and a preferred direction of the current-carrying planes (a-b) is adjusted in such a way that an external magnetic flux direction of the magnetic flux lines (B) of the configuration of magnets (1, 6-8, 11-14, 30-32, 34, 50-53) runs parallel to the normals on the current-carrying planes (a-b) of the grains.

3. Magnetic bearing according to claim 1 or 2, characterized in that the configuration of has a plurality of magnets (1; 6, 7, 8; 11, 12, 13, 14; 30, 31, 32, 34; 50, 51, 52, 53) in series along a shaft, wherein each magnet (1; 6, 7, 8; 11, 12, 13, 14; 30, 31, 32, 34; 50, 51, 52, 53) is oriented with its poles oppositely aligned relative to the next magnet (1; 6, 7, 8; 11, 12, 13, 14; 30, 31, 32, 34; 50, 51, 52, 53) in the series, and in that the normals on the current-carrying planes

are directed vertical to this shaft, wherein a distance of more than 0.1 mm is provided between the first (1, 20) and second part (3, 10).

4. Magnetic bearing according to claim 3, characterized in that the first part (1, 20) is mounted so as to be rotatable relative to the second part (3, 10), wherein the shaft (8; 45) is the axis of rotation and the normals on the current-carrying planes are directed radial to the axis of rotation.

5. Magnetic bearing according to claim 3 or 4, characterized in that the distance between the first (1, 20) and second part (3, 10) is between 1 mm and 10 mm, especially between 2mm and 7 mm.

6. Magnetic bearing according to one of claims 1 to 5, characterized in that the first part (1, 20) is constructed as a rotor and the second part (3, 10) is constructed as a stator of an electric motor.

7. Magnetic bearing according to claim 1 or claim 1 in combination with one of claims 3 to 6, characterized in that the grains have a grain size between 2 mm and 20 mm.

8. Magnetic bearing according to one of claims 1 to 7, characterized in that the crystal contains or is made of an X-barium-copper-oxygen compound, where X is a rare earth metal from the group Y, Sm, Nd, Tb.

9. Magnetic bearing according to claim 8, characterized in that the crystal contains or is made of a compound $Y_X Ba_2Cu_3O_{(8-x)}$.

10. Magnetic bearing according to one of claims 1 to 9, characterized in that the cooling system is provided in the form of a small refrigeration machine (44) which cools the second part (3, 10).

11. Magnetic bearing according to claim 10, characterized in that the small refrigeration machine (44) is a Stirling engine.

12. Magnetic bearing according to one of claims 1 to 11, characterized in that the first (1, 20) and second part (3, 10) are enclosed by an air-tight housing (62).

13. Magnetic bearing according to claim 12, characterized in that the housing (62) is evacuated until attaining a pressure of less than 10^{-4} Pa.

14. Magnetic bearing according to claim 12, characterized in that the housing (62) is filled with a gas having a molecular weight of less than 28, especially with helium.

15. Magnetic bearing according to one of claims 1 to 14, characterized in that the magnets (1; 6, 7, 8; 11, 12, 13, 14; 30, 31, 32, 34; 50, 51, 52, 53) in the first part are permanent magnets.

16. Motor with a magnetic bearing according to one of claims 1 to 15, in which a rotor is magnetically mounted relative to a stator, wherein the stator, as second part (3, 10) of the magnetic bearing, has a Type II superconducting material (2) which contains an anisotropic crystal or a plurality of grains formed of the latter, wherein, in the superconducting state, the current flowing in the latter in every grain flows in a current-carrying plane (a-b) of the grain, and the crystal, or all crystals in case of a plurality of grains, is/are oriented with the normals on the current-carrying planes (a-b) to the axis of rotation of the rotor as first part (1, 20) of the magnetic bearing.

17. Use of the motor according to claim 16 for driving a polygon mirror (40) which is fastened to the rotating shaft of the motor.

18. Use of the motor according to claim 16 with a magnetic bearing and with a housing (62) according to one of claims 12 to 14 for driving a polygon mirror (40) in a video system by which a light bundle provided for showing image points of a video system is scanned cyclically with respect to time, wherein the housing (62) encloses the bearing as well as the polygon mirror (40) and one or two windows are provided in the housing (62) for the scanning light bundle to enter and exit.

19. A magnetic bearing comprising:

a first part being mounted magnetically relative to a second part;

said second part having a Type II superconducting material containing an anisotropic crystal or a plurality of grains formed of said anisotropic crystal;

said crystal being anisotropic in that the superconducting current flows in current-carrying planes;

said first part having a configuration of magnets with which the superconducting material interacts;

said crystal itself or the plurality of grains formed of said anisotropic crystal facing the first part with normals to the current-carrying planes;

and a polygon mirror which is fastened to said first part.

20. A magnetic bearing comprising:

a first part further comprising a configuration of magnets and being mounted magnetically relative to a second part;

said second part being a Type II superconducting material which can be cooled to

below its critical temperature by a connected cooling system;

said superconducting material containing a plurality of grains, each comprising an anisotropic crystal;

current flowing in the superconducting state flowing in every grain in a current-carrying plane of the grain;

said superconducting material, in terms of its structure, being a melt-textured multigrain material with grain sizes in the range of 2 mm to 20 mm;

a preferred direction of the current-carrying planes being adjusted so that an external magnetic flux direction of the magnetic flux lines of the configuration of magnets runs parallel to the normals of the current-carrying planes of the grains.

21. The magnetic bearing according to claim 19, wherein the configuration has a plurality of magnets in series along a shaft, wherein each magnet is oriented with its poles oppositely aligned relative to the next magnet in the series, and wherein the normals on the current-carrying planes are directed vertically to this shaft, wherein a distance of more than 0.1 mm is provided between the first and second part.

22. The magnetic bearing according to claim 20, wherein the configuration has a plurality of magnets in series along a shaft, wherein each magnet is oriented with its poles oppositely aligned relative to the next magnet in the series, and wherein the normals on the current-carrying planes are directed vertically to this shaft, wherein a distance of more than 0.1 mm is provided between the first and second part.

23. The magnetic bearing according to claim 21, wherein the first part is mounted so as to be rotatable relative to the second part, wherein the shaft is the axis of rotation and the normals on the current-carrying planes are directed radial to the axis of rotation.

24. The magnetic bearing according to claim 22, wherein the first part is mounted so as to be rotatable relative to the second part, wherein the shaft is the axis of rotation and the normals on the current-carrying planes are directed radial to the axis of rotation.

25. The magnetic bearing according to claim 21, wherein the distance between the first and second part is between 1 mm and 10 mm.

26. The magnetic bearing according to claim 22, wherein the distance between the first and second part is between 1 mm and 10 mm.

27. The magnetic bearing according to claim 25, wherein the distance between the first and second part is between 2 mm and 7 mm.

28. The magnetic bearing according to claim 26, wherein the distance between the first and second part is between 2 mm and 7 mm.

29. The magnetic bearing according to claim 19, wherein the first part is

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constructed as a rotor and the second part is constructed as a stator of an electric motor.

30. The magnetic bearing according to claim 20, wherein the first part is constructed as a rotor and the second part is constructed as a stator of an electric motor.

31. The magnetic bearing according to claim 19, wherein the grains have a grain size between 2 mm and 20 mm.

32. The magnetic bearing according to claim 19, wherein the crystal contains or is made of an X-barium-copper-oxygen compound, where X is a rare earth metal from the group Y, Sm, Nd, Tb.

33. The magnetic bearing according to claim 20, wherein the crystal contains or is made of an X-barium-copper-oxygen compound, where X is a rare earth metal from the group Y, Sm, Nd, Tb.

34. The magnetic bearing according to claim 32, wherein the crystal contains or is made of a compound $Y_X Ba_2Cu_3O_{(8-x)}$.

35. The magnetic bearing according to claim 33, wherein the crystal contains or is made of a compound $Y_X Ba_2Cu_3O_{(8-x)}$.

36. The magnetic bearing according to claim 19, wherein a cooling system is provided in the form of a small refrigeration machine which cools the second part.

37. The magnetic bearing according to claim 20, wherein a cooling system is provided in the form of a small refrigeration machine which cools the second part.

38. The magnetic bearing according to claim 36, wherein the small refrigeration machine is a Stirling engine.

39. The magnetic bearing according to claim 37, wherein the small refrigeration machine is a Stirling engine.

40. The magnetic bearing according to claim 19, wherein the first and second part are enclosed by an air-tight housing.

41. The magnetic bearing according to claim 20, wherein the first and second part are enclosed by an air-tight housing.

42. The magnetic bearing according to claim 40, wherein the housing is evacuated until attaining a pressure of less than 10^{-4} Pa.

43. The magnetic bearing according to claim 41, wherein the housing is evacuated

until attaining a pressure of less than 10^{-4} Pa.

44. The magnetic bearing according to claim 40, wherein the housing is filled with a gas having a molecular weight of less than 28.

45. The magnetic bearing according to claim 40, wherein the housing is filled with helium.

46. The magnetic bearing according to claim 41, wherein the housing is filled with a gas having a molecular weight of less than 28.

47. The magnetic bearing according to claim 41, wherein the housing is filled with helium.

48. The magnetic bearing according to claim 19, wherein the magnets in the first part are permanent magnets.

49. The magnetic bearing according to claim 20, wherein the magnets in the first part are permanent magnets.

50. A motor with a magnetic bearing according to claim 19, comprising:

a rotor being magnetically mounted relative to a stator;

said stator, as second part of the magnetic bearing, having a Type II superconducting material which contains an anisotropic crystal or a plurality of grains formed of the latter;

in the superconducting state, current flowing in the latter in every grain flows in a current-carrying plane of the grain, and the crystal, or all crystals in the case of a plurality of grains, being oriented with the normals on the current-carrying planes to the axis of rotation of a rotor as first part of the magnetic bearing.

51. A motor with a magnetic bearing according to claim 20, comprising:

a rotor being magnetically mounted relative to a stator;

said stator, as second part of the magnetic bearing, having a Type II superconducting material which contains an anisotropic crystal or a plurality of grains formed of the latter;

in the superconducting state, current flowing in the latter in every grain flows in a current-carrying plane of the grain, and the crystal, or all crystals in the case of a plurality of grains, being oriented with the normals on the current-carrying planes to the axis of rotation of a rotor as first part of the magnetic bearing.

52. A method of using the motor of claim 50, comprising the step of:

driving a polygon mirror which is fastened to the rotating shaft of the motor.

53. A method of using the motor of claim 51, comprising the step of:

driving a polygon mirror which is fastened to the rotating shaft of the motor.

54. A method of using the motor of claim 50, comprising the step of:

using the motor with a magnetic bearing and with a housing for driving a polygon mirror in a video system by which a light bundle provided for showing image points of a video system is scanned cyclically with respect to time, wherein the housing encloses the bearing as well as the polygon mirror and one or two windows are provided in the housing for the scanning light bundle to enter and exit.

55. A method of using the motor of claim 51, comprising the step of:

using the motor with a magnetic bearing and with a housing for driving a polygon mirror in a video system by which a light bundle provided for showing image points of a video system is scanned cyclically with respect to time, wherein the housing encloses the bearing as well as the polygon mirror and one or two windows are provided in the housing for the scanning light bundle to enter and exit.

56. A magnetic bearing comprising a Type II superconducting material (2) which is a melt-textured multigrain material and which is made of or contains a $X_xBa_2Cu_3O_{(7-\delta)}$ compound with X being a rare earth metal from the group Y, Sm, Nd, Tb, and with $1 \leq x \leq 1.6$ and $0.01 \leq \delta \leq 0.10$.

57. The magnetic bearing according to claim 56, comprising a first part (1, 20) and

a second part (3, 10) , wherein said first part (1, 20) has permanent-magnetic characteristics at least in some areas thereof and is mounted magnetically relative to said second part (3, 10) and wherein said second part (3,10) comprises the Type II superconducting material (2).

58. The magnetic bearing according to claim 56, wherein said superconducting material (2) contains a plurality of grains, which comprise current-carrying, crystalline planes (a-b) wherein normals on said planes point to said first part.

59. The magnetic bearing according to claim 58, wherein said first part (1, 20) comprises a configuration of magnets which has a plurality of magnets (1; 6, 7, 8; 11, 12, 13, 14; 30, 31, 32, 34; 50, 51, 52, 53) in series along a shaft (8; 45) and wherein said first part is mounted so as to be rotatable relative to the second part (3, 10), with the shaft (8; 45) being the axis of rotation and the normals on the current-carrying planes pointing to the axis of rotation.

60. The magnetic bearing according to claim 57, wherein the distance between the first (1, 20) and second part (3, 10) is between 1 mm and 10 mm, especially between 2 mm and 7 mm.

61. The magnetic bearing according to claim 60, wherein the multigrain material comprises grains having a dimension between 2 and 20 mm.

62. The magnetic bearing according to claim 60, wherein the magnets (1; 6, 7, 8; 11,

12, 13, 14; 30, 31, 32, 34; 50, 51, 52, 53) in the first part are permanent magnets.

63. The magnetic bearing according to claim 57, wherein said first part (1, 20) is constructed as a rotor and the second part (3, 10) is constructed as a stator of an electric motor.

64. The magnetic bearing according to claim 57, in which said first part is connected with a polygon mirror (40).

65. The magnetic bearing according to claim 57, wherein the first (1, 20) and second part (3, 10) are enclosed by an air-tight housing (62).

66. The magnetic bearing according to claim 65, wherein the housing (62) is evacuated to a pressure of less than 10^{-4} Pa or the housing (62) is filled with a gas having a molecular weight of less than 28, especially with helium.

67. The magnetic bearing according to claim 58, wherein each magnet (1; 6, 7, 8; 11, 12, 13, 14; 30, 31, 32, 34; 50, 51, 52, 53) is oriented with its poles oppositely aligned relative to the next magnet (1; 6, 7, 8; 11, 12, 13, 14; 30, 31, 32, 34; 50, 51, 52, 53) in the series, and wherein the normals on the current-carrying planes are directed vertical to said shaft (8; 45), and wherein a distance of more than 0.1 mm is provided between the first (1, 20) and second part (3, 10).

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